Benefits By Program Area

Program Area / Benefit Measure		Summary
Arterial Management Systems	Safety Improvements	Automated enforcement of traffic signals has reduced red-light violations 20-75%.
	Mobility	Field studies in several cities have shown that adaptive signal control systems can reduce peak period travel times 5-42%.
	Throughput	Adaptive signal control integrated with freeway ramp meters in Glasgow, Scotland increased vehicle throughput 20% on arterials and 6% on freeways.
	Customer Satisfaction	In Michigan, 72% of drivers surveyed felt "better off" after signal control improvements.
	Productivity	Transit signal priority on a Toronto transit line allowed same level-of-service with less rolling stock.
	Energy/Environment	Model estimates showed advanced traffic signal control systems can reduce fuel consumption 0-13%.*
Freeway Management Systems	Safety Improvements	A survey of traffic management centers in eight cities found that ramp metering reduced the accident rate by 24-50%.
	Mobility	A simulation of a Detroit freeway found that HAR and DMS in combination with ramp metering could reduce vehicle delay up to 22%.
	Throughput	After ramp meters were experimentally turned off in the Twin Cities, MN, freeway volume declined 9% and peak period throughput decreased 14%.
	Customer Satisfaction	A survey of Wisconsin drivers found that 18% of respondents changed travel routes more than 5 times/mo. based on traveler information posted on DMS.
	Productivity	Variable speed limits with lane controls on the German Autobahn reduced injury accidents 20-29% saving approximately $4 million/year.
	Energy/Environment	In Denver, dynamic message signs (DMSs) that displayed real-time vehicle emission levels motivated most motorists surveyed to consider repairs.
Transit Management Systems	Safety Improvements	
	Mobility	Computer Aided Dispatch (CAD) and Automatic Vehicle Location (AVL) technologies improved on-time bus performance 9-23%.
	Throughput	In Portland, OR, models of transit data showed AVL/CAD may allow same level-of-service to more travelers using the same rolling stock.
	Customer Satisfaction	84% of survey respondents indicated on-board next-stop announcements made it easier for them to get around Acadia National Park in Maine.
	Productivity	In Spain, remote maintenance monitoring and dynamic scheduling allowed a bus system to reduce the time to detect and correct vehicle faults 20-30%.
	Energy/Environment	
Incident Management Systems	Safety Improvements	In Pennsylvania, Traffic and Incident Management Systems (TIMS) decreased secondary incidents on highways 40% between 1993 and 1997.
	Mobility	An incident management program in Maryland reduced average incident duration by 57% in 2000 and 55% in 1999.
	Throughput	
	Customer Satisfaction	TMC staff in Pittsburgh, Pennsylvania found real-time traffic information useful and noted that it improved coverage for incident management.
	Productivity	Studies of freeway service patrols in 3 U.S. cities resulted in delay savings equating to $1.2 to $1.8 million in annual benefits.
	Energy/Environment	The freeway and incident management program in San Antonio, Texas saves an estimated 2,600 gallons of fuel per major incident.
Emergency Management Systems	Safety Improvements	
	Mobility	
	Throughput	
	Customer Satisfaction	EMTs and doctors had mixed opinions about a telemedicine program tested on ambulances in San Antonio, expected positive impacts in rural areas.*
	Productivity	In New Mexico, a private ambulance company used CAD/AVL to guide ambulances to exact locations. The company increased efficiency 10-15%.
	Energy/Environment	
Electronic Payment	Safety Improvements	In Florida, driver uncertainty about toll plaza configuration and traffic speeds contributed to a 48% increase in accidents at E-PASS toll stations.*
	Mobility	The New Jersey Turnpike Authority (NJTA) E-Zpass system reduced overall toll station traffic delay by 85%.
	Throughput	Tappan Zee Bridge, New York, NY: Manual lane 400-450 vehicles/hour (vph), ETC lane 1000 vph.
	Customer Satisfaction	In Europe, user acceptance and satisfaction with a multi-use smart card payment system for transit, shops, libraries, and other services was high: 71-87%.
	Productivity	The Ventura, CA, electronic transit fare payment saved an est. $9.5 million/yr. in fare evasion, $5M in reduced data collection and $1M in transfer slip costs.
	Energy/Environment	A model of air quality at a toll station in FL showed ETC decreased CO by 7.3%, hydrocarbons by 7.2% and increased NOx by 34%.*
Traveler Information	Safety Improvements	IDAS models of ARTIMIS in Cincinnati and Northern Kentucky estimated traveler information reduced fatalities 3.2%.
	Mobility	In the DC metro area, simulation estimated that regular users of traveler info. reduced their frequency of early and late arrivals by 56% and 52%, respectively.
	Throughput	Modeling studies in Detroit, Seattle, and Washington, DC have shown slight improvements in corridor capacity with provision of traveler information.*
	Customer Satisfaction	90% of survey respondents found Virginia's 511 system useful, over half indicated they had change routes based on information received at least once.
	Productivity	In the DC area, models showed pre-trip departure notification can reduce early/late arrivals and save 40% of users $60 or more each year in lost time.
	Energy/Environment	Models of vehicle emissions in Boston showed users of Smart Traveler generated 1.5% less NOx, 25% less VOCs, and 33% less CO.
Information Management	Safety Improvements	
	Mobility	
	Throughput	
	Customer Satisfaction	
	Productivity	
	Energy/Environment	
Crash Prevention & Safety	Safety Improvements	In Colorado, a downhill speed warning system on interstate I-70 decreased truck accidents 13%, and reduced runaway ramp usage 24% in 2 years.
	Mobility	Models of increased traffic flow at a San Antonio rail crossing showed dynamic message signs with delay information can reduce system delay 6.7%.
	Throughput	
	Customer Satisfaction	70% of truck drivers and 85% of car drivers surveyed in California felt curve speed warning systems were useful.
	Productivity	
	Energy/Environment	An automated horn warning system in Ames, Iowa, reduced elevated noise impact areas 97% adjacent to a highway rail intersection.
Operations & Maintenance	Safety Improvements	In Iowa, 55% of truckers surveyed said the automated work zone CB-radio warning system first alerted them of painting crews on I-35.
	Mobility	Work zone surveillance and incident response at the "Big-I" interchange in Albuquerque, NM, reduced average clearance time 44% the first year.
	Throughput	
	Customer Satisfaction	Most people surveyed about the Minnesota Guidestar program said Smart Work Zone warning signs were accurate and useful.
	Productivity	In MT, WIM scales installed in travel lanes on major truck routes can improve pavement fatigue estimates and save $4.1 M/year in construction costs.
	Energy/Environment	
Road Weather Management	Safety Improvements	In Idaho, weather-related warnings on freeway dynamic message signs decreased vehicle speeds 35% compared to a 9% decrease without the signs.
	Mobility	Signal timing plans implemented in Minnesota to accommodate adverse winter weather resulted in an 8% reduction in delay.
	Throughput	
	Customer Satisfaction	A survey found that 94% of users felt a Washington State road weather information website made them better prepared for their trips.
	Productivity	In Minnesota, closing part of a freeway allowed it to be cleared of snow 4 hrs more quickly, at 18% lower cost, than a nearby highway that remained open.
	Energy/Environment	
Commercial Vehicle Operations	Safety Improvements	A truck inspection selection system tested in CT yielded 2% increase in the rate of out-of-service orders, nationwide deployment est. to avoid 84 crashes/yr.
	Mobility	Centralized route planning systems tested in Europe reduced vehicle travel distances by 18% and travel times by 14%.
	Throughput	
	Customer Satisfaction	A survey of truck and motorcoach drivers found that they held favorable opinions of electronic clearance programs.
	Productivity	Most truck drivers and inspectors surveyed during the CVISN model deployment felt that electronic screening saved them time.
	Energy/Environment	
Intermodal Freight	Safety Improvements	
	Mobility	A modeling study found that an appointment system for scheduling truck arrivals at cargo transfer facilities could reduce truck's in-terminal time by 48%.
	Throughput	
	Customer Satisfaction	Carriers surveyed indicated they were very satisfied with the ability of electronic supply chain manifest systems to duplicate paper-based systems.
	Productivity	Field tests showed that time spent on manifesting and processing load transfers decreased by 57-100% using an electronic supply chain manifest system.
	Energy/Environment	
Intelligent Vehicles	Safety Improvements	In Erie, NY, dispatch center notification time was about 1 min. for vehicles equipped with automated collision notification, and 3 to 46 minutes without.
	Mobility	In Turin, Italy, cars equipped with in-vehicle navigation systems experienced a travel time savings of more than 10% during the CLEOPATRA project.
	Throughput	A simulation study found dynamic route guidance to vehicles enabled the network to accommodate a 10% increase in demand.
	Customer Satisfaction	Participants overwhelmingly ranked intelligent cruise control over manual or conventional cruise control for convenience, comfort, and enjoyment.
	Productivity	A trucking company's operating costs declined 10% after they installed GPS/AVL systems to eliminate miscommunication between drivers and dispatch.
	Energy/Environment	Field data shows introducing an ICC vehicle into traffic with manually controlled cars can smooth traffic flow and reduce fuel consumption 0.4-3.6%.

Source: http://www.itsbenefits.its.dot.gov *Database also includes negative/neutral impacts of ITS. Date: 9/2/2005

Benefits By Measure

	Benefit Measure/ Program Area	Summary
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	Freeway Management	A survey of traffic management centers in eight cities found that ramp metering reduced the accident rate by 24-50%.
	Transit Management	
	Incident Management	In Pennsylvania, Traffic and Incident Management Systems (TIMS) decreased secondary incidents on highways 40% between 1993 and 1997.
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	Electronic Payment	In Florida, driver uncertainty about toll plaza configuration and traffic speeds contributed to a 48% increase in accidents at E-PASS toll stations.*
	Traveler Information	IDAS models of ARTIMIS in Cincinnati and Northern Kentucky estimated traveler information reduced fatalities 3.2%.
	Information Management	
	Crash Prevention & Safety	In Colorado, a downhill speed warning system on interstate I-70 decreased truck accidents 13%, and reduced runaway ramp usage 24% in 2 years.
	Operations & Maintenance	In Iowa, 55% of truckers surveyed said the automated work zone CB-radio warning system first alerted them of painting crews on I-35.
	Roadway Weather Mgmt	In Idaho, weather-related warnings on freeway dynamic message signs decreased vehicle speeds 35% compared to a 9% decrease without the signs.
	Commercial Vehicle Ops.	A truck inspection selection system tested in CT yielded 2% increase in the rate of out-of-service orders, nationwide deployment est. to avoid 84 crashes/yr.
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	Crash Prevention & Safety	Models of increased traffic flow at a San Antonio rail crossing showed dynamic message signs with delay information can reduce system delay 6.7%.
	Operations & Maintenance	Work zone surveillance and incident response at the "Big-I" interchange in Albuquerque, NM, reduced average clearance time 44% the first year.
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